

Lecture 10

Gambling

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PS4168: Economic Psychology

Overview

- Some Gambling Games
- Problem Gambling
- Further Reading
- Activity

Recap on last week

- What does MJAC stand for?
 - premises/assumptions/insights of MJAC
- What is the role of punishment/sanctions (direct or indirect) in ensuring fairness?

Gambling

Gambling and Economic Psychology

- Mental Accounting example:
 - gamblers who have won some money early in the evening put that money into a different pocket from their 'own' money
 - each pocket is a separate mental account(Thaler, 2003, p. 94)

Gambling

- Lotteries
- Scratch Cards
- Roulette
- Fruit Machines
- Sports Betting
- Card Games

Lotteries

Lotteries

- 180 lotteries worldwide
 - Total size of lottery industry is estimated to be \$284 billion
 - In the United Kingdom, 59% of adults purchased the National (Markel, La Fleur, & La Fleur, 2015; Ranyard, 2018)



Lotto Rules

- Different lotteries have different specific rules
 - The UK uses a 6 from 49 system
 - Ireland uses 6 from 47
 - Used to be 6 from 36
 - Euromillions 5 from 50
 - Plus 2 *star* numbers from 1 – 12



Lotto Combinations

Lotto Combinations

$$\frac{n!}{(n-x)!x!}$$

Lotto Combinations

$$\frac{n!}{(n-x)!x!}$$

```
factorial(47) /  
(factorial(47-6) * factorial(6))
```

[1] 10737573

- 10,737,573 possible combinations

Winning through *brute force*

- Irish lotto used to be 6 from 36

Winning through *brute force*

- Irish lotto used to be 6 from 36

```
factorial(36) /  
(factorial(36-6) * factorial(6))
```

[1] 1947792

- 1,947,792 possible combinations of *winning* at £0.50 a line

Winning through *brute force*

- Irish lotto used to be 6 from 36

```
factorial(36) /  
(factorial(36-6) * factorial(6))
```

[1] 1947792

- 1,947,792 possible combinations of *winning* at £0.50 a line

Winning through *brute force*

- Irish lotto used to be 6 from 36

```
factorial(36) /  
(factorial(36-6) * factorial(6))
```

[1] 1947792

- 1,947,792 possible combinations of *winning* at £0.50 a line

```
0.5*( factorial(36) /  
(factorial(36-6) * factorial(6)) )
```

[1] 973896

- All combinations could be purchased for £973,896

Winning through *brute force*

- In 1990 Stefan Klincewicz and Paddy Mulligan put together a 10 man syndicate
 - Each person paid £30 over 10 weeks
 - Between them they won Lotto jackpot of £2,439,760 in April, 1990(Collins, 2017)



Winning through *brute force*

- In 1992 Stefan Klincewicz and 28 member Dublin-based syndicate
 - Filled out 243,474 Lotto coupons in preparation
- The May Bank Holiday weekend 1992 Jackpot was £1.7 million
- They bought over 80% of the combinations (spending ~ £820,000)
 - They had the winning numbers on the night
 - But two other winning tickets were also sold
 - Could claim only one-third of the jackpot, or £568,682
- **But** Match-5 and match-4 prizes brought the syndicate's total winnings to approximately £1,166,000
 - profit of approximately £310,000

Playing the Lottery

- The representativeness heuristic:
 - The winning numbers should look random
 - People likely avoid numbers that 'do not look random enough'
 - regular intervals or those that do not distribute sparsely across the whole range of possible numbers(Baboushkin, Haroorn, Derevensky, & Gupta, 2001; Holtgraves & Skeel, 1992)
- Illusion of control:
 - Over estimate ability to choose winning numbers
 - *Gambler's Fallacy:*
 - avoiding numbers that have appeared recently(Clotfelter & Cook, 1991; Langer, 1975; Wohl & Enzle, 2002)
- Superstition (Ariyabuddhiphongs & Chanchalermpong, 2007)

Explaining the Lottery

- Suggestions?

Explaining the Lottery

- Prospect Theory: People tend to overestimate low odds of winning
 - far lower than what people experience in everyday life
 - fail to estimate just how tiny they actually are (Kahneman & Tversky, 1979; Ranyard, 2018)
- Availability heuristic: Salient wins (Ranyard, 2018; Tversky & Kahneman, 1973; see also Decision Sampling Theory, Stewart, Chater, & Brown, 2006)
- Social activity?
- Excitement?
- 'entrapped'
 - Might miss the jackpot(Beckert & Lutter, 2013; Binde, 2013 uploaded; Forrest, Simmons, & Chesters, 2002)

Scratch Cards

Scratch Cards

- Low chance of winning high amounts
 - e.g., 1 in 4,347,890 chance of winning £4 million
- Reasonable chance of winning smaller amounts
 - e.g., 1 in 6 chance of winning £10
- Expected loss of £3 for every £10 spent



Scratch Cards

Explanations???

- Instant feedback
- Near miss effects
- Social
 - Gifts

Roulette

Roulette

- Transparent odds; Pure luck
- 37 slots (Europe - 38 in USA)
- Numbers from 0 – 36
 - $\frac{1}{2}$ Red
 - $\frac{1}{2}$ Black
- Can bet on a single slot or a selection
 - Payout for single number is 35 to 1
 - Payout for even/odd, Red/Black is almost 1 to 1
 - Payout for selection of 12 numbers is 2 to 1 (Ranyard, 2018)



Roulette

- Expected return is $36/37$ ($36/38$ in USA)

Roulette

Explanations???

Roulette

- Can lead to ***Loss Chasing***
 - Gamblers continue to gamble more after a loss
- A **Mental Account** for a gambling session
 - If they stop they 'close' the account at a **loss**
 - A 'sure' loss
 - Keeping the mental account open the loss is not *realised* (still a *paper loss*)
 - possibility of winning it back(Ranyard, 2018)

Fruit Machines

Fruit Machines

- Fruit machines are said to be most addictive form of gambling
 - It takes just over a year to become addicted
 - Takes over three years with traditional table games, such as roulette(N. Turner & Horbay, 2004)
 - 3 to 5 to five reels with pictures



Fruit Machines

- The player inserts a coin and then pulls down a handle (or presses a button)
 - The reels spin
 - When they stop, the combination of pictures forms a certain pattern
 - If the combination comprises three pictures that are the same (or some other designated pattern), a reward is given.
 - The most common winning combination is 777
- The odds of fruit machines are unknown
 - Pure chance



Fruit Machines and Near Misses

- **Near Misses:** a losing pattern that is very similar to a winning one
 - e.g., reels may stop at 776 very similar to 777
- Gamblers feel that luck is with them and that success is on its way
 - Near-miss experiences tend to encourage more gambling (Griffiths, 1991; Reid, 1986)

Explaining Near Misses

- Evolutionary explanations?
 - In natural environments to which we are adapted by evolution, a near miss may be close to a win
 - e.g., almost catching prey clearly indicates that prey is nearby and your skill levels are probably adequate to make a kill
 - May not hold for artificial environments (776 is not *nearly* 777)
- Near miss is mistaken for a gain
 - Same part of the brain(Clark, Lawrence, Astley-Jones, & Gray, 2009)
- Near misses registered as gains will result in gamblers' receiving positive reinforcement even when they are losing money

Card Games

Card Games

- Both luck and expertise
- Blackjack
 - Closest to 21 without exceeding 21
 - Not **Pure Chance**
 - Counting cards (e.g., MIT blackjack team Mezrich, 2002)
 - Statistically possible to profit from Blackjack (unlike previous games)
(DeDonno & Detterman, 2008; Javarone, 2015; N. E. Turner, 2008)



Card Games

- Poker
 - Different variations
 - Aim to have highest ranked combination of cards
- Players can choose to increase the stake or to fold
- Players win either by having the highest rank of the combination
 - or by being the only person remaining
- Evidence for expertise (DeDonno & Detterman, 2008; Fiedler & Rock, 2009; Hannum & Cabot, 2012; Javarone, 2015; N. E. Turner, 2008)



Sports betting

Sports betting

- Horse racing (16%)
- Football matches (4%)
- Dog racing (4%)
- Other (9%) (Ranyard, 2018; Wardle, Moody, Griffiths, Orford, & Volberg, 2011)
- Gamblers can bet against the bookmaker or against each other
- Traditionally, the bookmaker sets the odds
- The gamblers bet that a certain event will occur (back) and the bookmaker bets that it will not (lay)



Sports betting

- Gamblers may use statistics to inform their betting
- Not much evidence for expertise
 - Experts won more times than randomly selected betters
 - but did not win any more money (Ladouceur, Sylvain, Letarte, Giroux, & Jacques, 1998)
 - Experts were just more cautious - safe bets
 - not gambling at all is likely a safer strategy (Ranyard, 2018)
- Superstition
 - hot hand

Explanations for Gambling Behaviour

(taken from Ranyard, 2018, p. 305)

Explanations for Gambling Behaviour

| Games | Characteristics | Prevalence as a percentage all UK adults (Wardle et al., 2011) | Biases, fallacies, and other reasons to gamble |
|----------------|--|---|---|
| Lottery | Low frequency, fixed odds, pure chance | National Lottery 59 Other lotteries 25 | Overestimation of low odds |
| Scratch cards | High frequency, fixed odds, pure chance | 24 | The availability heuristic Entrapment |
| Roulette | High frequency, fixed odds, pure chance | In a casino 5 Online games that include roulette 13 | The representativeness heuristic Illusions of control |
| Fruit machines | High frequency, fixed odds, pure chance | 18 | The gambler's fallacy The hot hand effect Superstitious behaviour |
| Sports betting | High frequency, flexible odds, may involve real skills | Horse racing 16 Football 4 Dog racing 4 Other sports events 9 | The near-miss effect Mental accounting Loss chasing |
| Card games | High frequency, flexible odds, may involve real skills | Poker (pub or club) 2 Casino card games 5 Online games that include card games 13 | High testosterone levels Abnormal levels of neurotransmitters Abnormal brain activity Card counting (a real skill) |

Alternative Explanations?

Alternative Explanations - Motivation

- learning and evaluating, rush, self-definition, risk-taking, cognitive self-classification, emotional self-classification, competing and communing (Cotte, 1997)
- control, lift, escape (Loroz, 2004)
- financial gain, intellectual challenge, excitement and social interaction (Bruce & Johnson, 1992)
- socialization, amusement, avoidance, excitement and monetary motives (Lee, Chae, Lee, & Kim, 2007)

Alternative Explanations - Motivation (contd.)

- money, excitement, social interaction, escape from problems, and self-esteem enhancement (Fang & Mowen, 2009)
- to win money, fun, for social reasons, excitement, just to have something to do (Neighbors, Lostutter, Cronce, & Larimer, 2002)
- winning, exploration, excitement, being friends, and being with similar people (Platz & Millar, 2001)

Five Dimensions (Binde, 2013)

- 1 The dream of hitting the jackpot
- 2 Social rewards
- 3 Intellectual challenge
- 4 Mood change
- 5 **The chance of winning**
 - 1 – 4 can be dependent on personal dispositions and preferences
 - 5 is always relevant

Tony 10

Tony 10

- Gambled €10m with Paddy Power
- Stole €1.75m from An Post
- His online-gambling addiction cost him his marriage
- Sentenced to 4 years in jail (served 18 months)
- Book (Lynch & O'Reilly, 2018)

Sports betting

<https://www.youtube.com/embed/1pWSppSdWWc?start=130>

Sports betting

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Problem Gambling

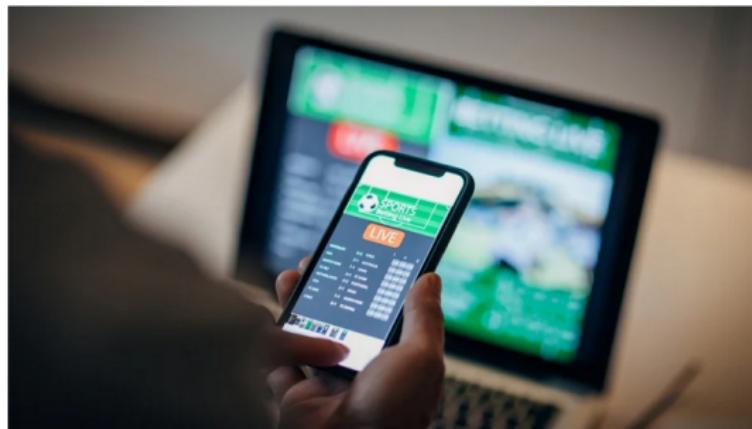
Problem Gambling

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Problem gambling more widespread than previously thought - ESRI

Updated / Thursday, 5 Oct 2023 19:07



The ESRI says the new figure would equate to 130,000 adults with problem gambling in Ireland (stock image)

Problem Gambling

- RTE Coverage at
<https://www.rte.ie/news/2023/1005/1409029-problem-gambling-ireland/> including clip from Morning Ireland
- ESRI Press Release at
<https://www.esri.ie/news/esri-estimates-1-in-30-adults-in-ireland-now-suffers-from-problem-gambling>
- Full ESRI report at
<https://www.esri.ie/system/files/publications/RS169.pdf>

Problem Gambling

- Problem gambling / gambling addiction / pathological gambling
 - defined 'persistent and recurrent problematic gambling behavior leading to clinically significant impairment or distress' (Association, 2013; Ranyard, 2018)
- Positively correlated to being male, young, having a low level of education, and having a low socio-economic status (Ranyard, 2018; Wardle et al., 2011)
- Problem gamblers viewing gambling scenarios
 - show decreased brain activity in regions that control impulse, emotion, and decision-making and that respond to loss
 - increased activity in regions associated with pleasure and risk taking (Potenza, 2014; Potenza et al., 2003; van Holst, van den Brink, Veltman, & Goudriaan, 2010)

Problem Gambling

- Linked with high testosterone levels
 - Iowa Gambling Task (Stanton, Liening, & Schultheiss, 2011)
- Multiple findings suggest a biological basis for risk seeking (Ranyard, 2018)

Problem Gambling

- 3 kinds of problem gambler
 - Poor judgement and decision making skills
 - No prior psychopathology
 - Habit develops: illusion of control/excitement/chasing losses etc.
 - Satisfy emotional needs
 - Family history / emotional vulnerabilities
 - Neurological / neurochemical dysfunctions
 - Impulsive/anti-social behaviours; substance abuse; criminality(Blaszczynski & Nower, 2002; Ranyard, 2018)

Further Reading

- Binde, P. (2013). Why people gamble: a model with five motivational dimensions. *International Gambling Studies*, 13(1), 81–97.
<https://doi.org/10.1080/14459795.2012.712150>
- ESRI report at
<https://www.esri.ie/system/files/publications/RS169.pdf>

Further 'reading'

<https://www.youtube.com/embed/7cjIWMUgPtY>

Discuss Part 1

Theories of Decision Making

Heuristics and Biases

Game Theory

Emotional Influences

Nudges and Other Contextual
Influences

Future Decisions and

Affective Forecasting

Loss Aversion/Risk Aversion

and Endowment Effects

Mental Accounting

Fairness and Ethics

***Identify examples of the above concepts in Gambling
behaviour***

Discuss Part 1

- Based on your knowledge of any of the content covered this semester, develop a theoretically informed intervention that could curb any form of problem gambling behaviour

References

References

- Ariyabuddhiphongs, V., & Chanchalermporn, N. (2007). A Test of Social Cognitive Theory Reciprocal and Sequential Effects: Hope, Superstitious Belief and Environmental Factors among Lottery Gamblers in Thailand. *Journal of Gambling Studies*, 23(2), 201–214. <https://doi.org/10.1007/s10899-006-9035-3>
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